

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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SERIAL NO.: 10/720,579 ART UNIT: 1753

FILED: November 24, 2003 EXAMINER: Wong, E.

TITLE: METHOD FOR MANUFACTURING VERY LOW ROUGHNESS
ELECTRODEPOSITED COPPER FOIL AND ELECTRODEPOSITED COPPER FOIL
MANUFACTURED THEREBY

Amendment B: REMARKS

Upon entry of the present amendments, previous Claims 1 - 22 have been canceled and new Claims 23 - 31 substituted for Claims 16-22. Claims 1-15 were previously canceled. Reconsideration of the rejections, in light of the forgoing amendments and present remarks, is respectfully requested. The present amendments have been entered for the purpose of distinguishing the present invention from the prior art.

In the Office Action, it was indicated that Claims 16 - 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Wolski patent in view of the Yates patent and the Merchant patent. Claim 22 was also rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

In reply to the Official Action, Applicant has extensively amended the original claim language in the form of new Claims 23 - 31. New Claims 23 - 31 recite the subject matter of original Claims 1-5 and 8-11 in proper U.S. format to distinguish the claims from the prior art combination.

In particular, new independent Claim 23 reflects the limitations of previous independent Claim 1. The step of "adding an additive" is not made obvious by the prior art combination because the composition is not disclosed. New dependent Claims 24 - 31 reflect, respectively, the limitations

found in previous dependent Claims 2-5 and 8 - 11. Applicant respectfully contends that the amendments herein serve to distinguish the present invention from the prior art combination.

In the method recited in new independent Claim 23, it is specified that the additive, added to the electrolyte solution, contains between 0.1ppm to 100ppm of a gelatin, 0.05ppm to 50ppm of hydroxyethyl cellulose (HEC), and 0.05ppm to 20ppm of bis(sodiumsulfopropyl)disulfide (SPS). Applicant respectfully contends that none of the prior art references, individually, or in combination, recite an additive that is added to the electrolyte solution and that has this composition. As such, without this additive, the prior art combination would fail to achieve the advantages of the present invention.

The disclosure of the Wolski patent does not disclose the bis(sodiumsulfopropyl)disulfide (SPS). The 3-mercapto-1-propanesulfonate (MPS) of the Wolski patent does not make the choice of SPS obvious. Although there are similar abilities for similar bivalent sulfur organic compounds, the particular selection of SPS is not an obvious choice. The Yates patent discloses even more bivalent sulfur organic compounds, including 2-mercaptobenzothiazole (MBT) and mercaptoethane sulfonic acid (MES).

The SPS is fabricated by combining monomers using the S-S bond, like MPS, MBT, and MES. However, the SPS does not decompose in the same manner as the other bivalent sulfur organic compounds. SPS is not reduced back to the monomer when placed in the claimed solution because the S-S bond of SPS is stronger than the S-S bond of MPS, for example. Additionally, SPS will result in a dimmer shade of foil than other bivalent sulfur organic compounds. As such, the disclosure of the group of bivalent sulfur organic compounds by the prior art does not make the particular selection of SPS obvious for patenting.

Although the Merchant patent discloses SPS, the Merchant patent does not teach the amounts and conditions of the SPS composition of the present invention. As a chemical composition patent application, the existence of SPS is not being claimed, but rather the inventive method for an application of this chemical. The present invention discloses a range of amounts and conditions for the additive that are not made obvious by the prior art combination. As such, independent Claim 23 has been placed into a condition for allowance.

The original subject matter and ranges for the composition have been included in the present amendment.

Claim 31 re-presents the subject matter of Claim 22. The indefiniteness of the claim language has been resolved by specifying "negative current" instead of "current".

Based upon the foregoing analysis, Applicant contends that independent Claim 23 is now in proper condition for allowance. Additionally, those claims which are dependent upon independent Claim 23 should also be in condition for allowance. Reconsideration of the rejections and allowance of the claims at an early date is earnestly solicited. Since no new claims have been added above those originally paid for, no additional fee is required.

A Request for Continued Examination and Petition for Extension of Time are filed concurrently herewith.

Respectfully submitted,

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Date

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